

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/JP03/09697

## A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl.<sup>7</sup> B29C63/48, B29C63/34, B32B1/08, B32B15/08, C23C22/07,  
F16L9/147

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl.<sup>7</sup> B29C63/00-63/48, B32B1/00-35/00, C23C22/00-22/86,  
F16L9/00-11/26

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1926-1996	Toroku Jitsuyo Shinan Koho	1994-2003
Kokai Jitsuyo Shinan Koho	1971-2003	Jitsuyo Shinan Toroku Koho	1996-2003

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
<u>Y</u>	JP 54-112977 A (Nippon Steel Corp.), 04 September, 1979 (04.09.79), Page 4, upper right column, line 7 to lower left column, line 10 (Family: none)	<u>1-7</u>
<u>Y</u>	JP 2988302 B2 (Sumitomo Metal Industries, Ltd.), 13 December, 1999 (13.12.99), Claims; Par. Nos. [0025] to [0026] & JP 8-187820 A	<u>1-7</u>
<u>Y</u>	JP 5-293931 A (Sekisui Chemical Co., Ltd.), 09 November, 1993 (09.11.93), Claims; Par. No. [0011] (Family: none)	<u>1-7</u>

☒ Further documents are listed in the continuation of Box C.
 ☐ See patent family annex.

* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family
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Date of the actual completion of the international search  
16 October, 2003 (16.10.03)Date of mailing of the international search report  
28 October, 2003 (28.10.03)Name and mailing address of the ISA/  
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

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## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
<u>Y</u>	JP 8-159368 A (Mitsubishi Chemical Corp.), 21 June, 1996 (21.06.96), Claims; Par. No. [0022] (Family: none)	<u>1-7</u>
<u>Y</u>	JP 9-70927 A (NKK Corp.), 18 March, 1997 (18.03.97), Claims; Par. No. [0017] (Family: none)	<u>1-7</u>
<u>Y</u>	US 3597283 A (THE LUBRIZOL CORP.), 03 August, 1971 (03.08.71), Full text & JP 50-14223 B1	<u>1-7</u>
<u>Y</u>	JP 61-7472 B2 (Nihon Parkerizing Co., Ltd.), 06 March, 1986 (06.03.86), Claims; tables 1, 2 & JP 57-82478 A	<u>1-7</u>
<u>Y</u>	US 4517030 A (TOYOTA MOTOR CORP.), 14 May, 1985 (14.05.85), Claims; table 1 & JP 60-39170 A & JP 62-9190 B2	<u>1-7</u>
<u>Y</u>	EP 56675 A2 (NIPPON PAINT CO., LTD.), 28 July, 1982 (28.07.82), Full text & EP 56675 B1 & JP 57-120678 A & JP 58-55229 B2	<u>1-7</u>
<u>Y</u>	US 4950339 A (METALLGESELLSCHAFT AG.), 21 August, 1990 (21.08.90), Column 3, lines 42 to 52; EXAMPLE & EP 327153 A2 & EP 327153 B1 & JP 1-259180 A & JP 2713334 B2	<u>1-7</u>
<u>Y</u>	JP 2-6014 A (Togawa Rubber Co., Ltd.), 10 January, 1990 (10.01.90), Claims; Page 2, upper right column, lines 6 to 20, lower left column, line 14 to lower right column, line 3; drawings (Family: none)	<u>5</u>
<u>E, A</u>	JP 2003-294174 A (Nippon Steel Corp.), 15 October, 2003 (15.10.03), (Family: none)	<u>1-7</u>